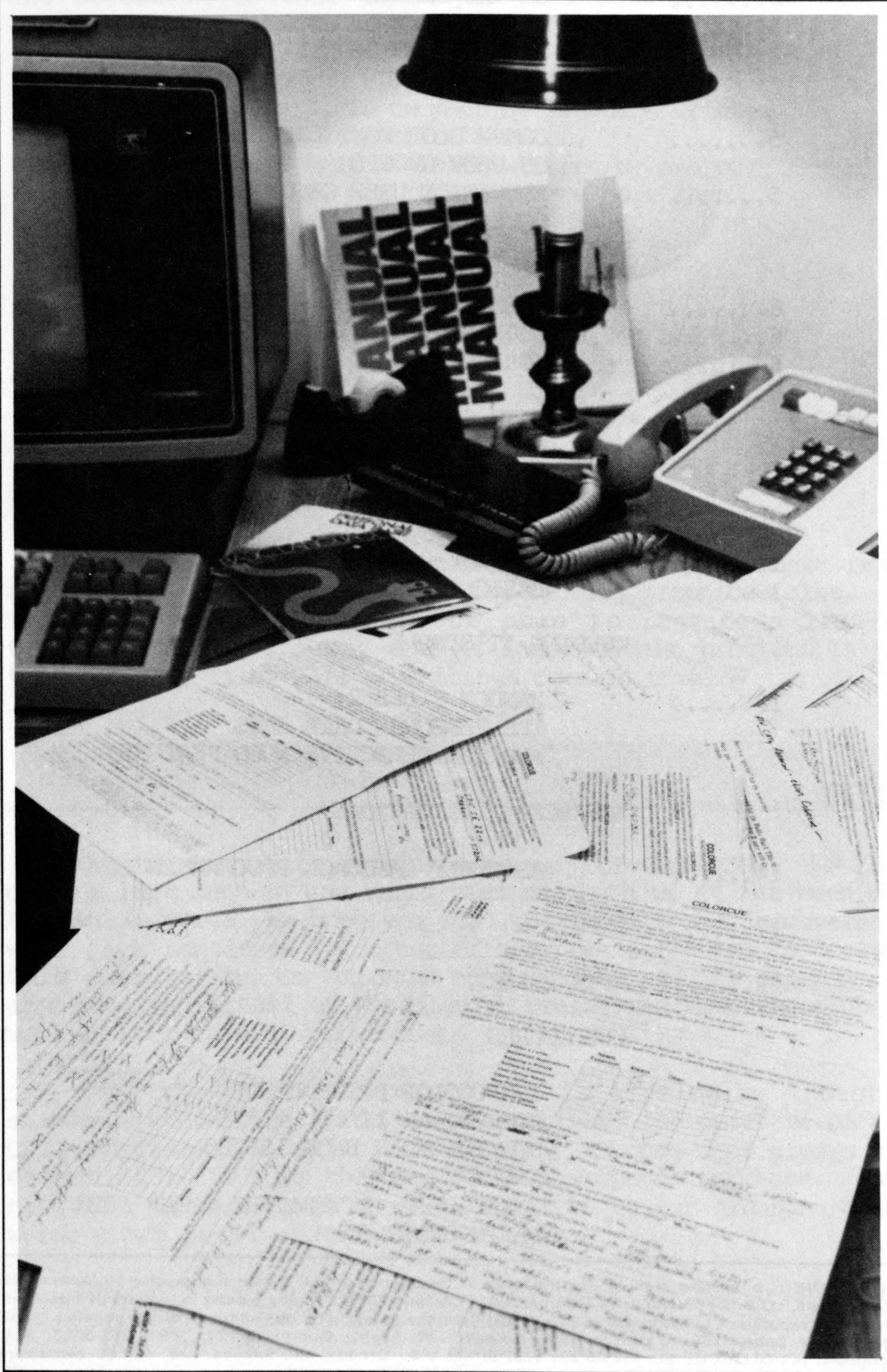


colorcue

a publication for Compucolor users · v.2, #7 · sept/oct 1979 · \$1

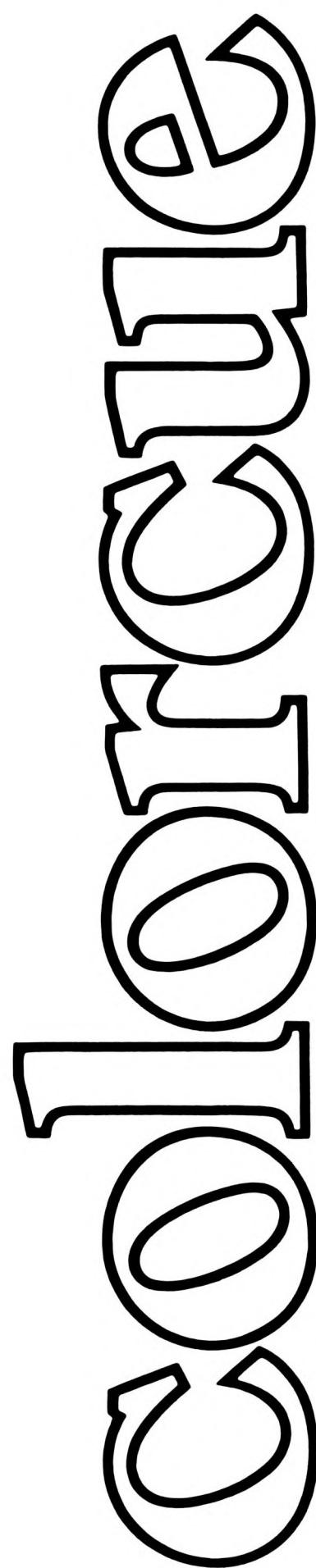


**we're
listening**

anniversary
of
education
specialty

inside

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COLORCUE!
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contributing to the success of this issue

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COLORCUE is published monthly for the users of the Compucolor II personal computer by Compucolor Corporation, P.O. Box 569, Norcross, Georgia 30071. Compucolor is a wholly owned subsidiary of Intelligent Systems Corporation, Inc. Address all COLORCUE correspondence to our editorial office located at 100 Northcreek, Suite #250, 3715 Northside Parkway, N.W., Atlanta, Georgia 30327, (404) 261-3003. Subscriptions to COLORCUE are \$12.00 per year in the U.S., Canada, and Mexico, and \$24.00 elsewhere. Copyright ©1979 by Compucolor Corporation, Inc. All rights reserved.

editor's letter

As I began to get your surveys back I quickly realized how much vital information you had been missing. I decided that it was important to take the extra time and gather some of that information together for you immediately, hence the delay. Therefore, this issue will be a double issue covering September and October. In this issue you will find a little bit of almost everything you've been clamoring for. For instance:

- Available software information,
- A terrific article on machine language written by one of our Compucolor wizards,
- Random Files Part 2 - also written by one of our wizards (we are lucky to have more than one wizard!),
- Back issue order form,
- An index (I'm an ex-librarian and can't work without one!),
- Some cost saving deals on disk drives and a way to get \$100 worth of software by bringing in new customers,
- Information on a new user group,
- Letters and programs from you,

and much more!

We will have more on assembly language in the next issue as well as something to quell the rioting graphics folks. In future issues, I hope to be able to provide a list of Compucolor user groups, and an index of the programs in the User Software File. All good things come in time. =

rem

October marks the first anniversary of **COLORCUE**. We have come a long way in one short year and much of it has been due to your support! We hope you will continue to see improvements with each new issue. Compucolor has been delighted to present this publication to you each month and we want to express our appreciation for all of your lavish praise and encouragement as well as your valuable criticism.

HAPPY
ANNIVERSARY
COLORCUE!

Even though the Compucolor II is a value by industry standards we realize that, for most of you, the purchase of the CCII represents a major investment. Strong user groups are essential to making the most of your computer purchase. Each new CCII owner brings special qualities to our group, a group which grows larger and stronger each day.

COLORCUE is a newsletter for Compucolor users but, more importantly, it is also a publication by Compucolor users. Thank you for all your help during our first year, we look forward to an even better second year.

COLORCUE is a great opportunity to get the most from your Compucolor! =

ON THE SURVEY

We have received approximately 20% of the readership surveys back so far. Don't be shy! This is your opportunity to voice your opinion on the future of a publication which could be of great help to you. The survey only takes a few moments to complete and has been postage prepaid -- please send us your comments **today**. We need your support in order to provide you with a publication that will give you the kind of information you need and want.

For those of you who are prompt, friendly, courteous and so forth -- thank you very much! We enjoyed reading your comments and are trying to answer as many of your questions as possible. Your suggestions for articles have been gratefully accepted and plans are being made right now for their inclusion in upcoming issues of **COLORCUE**.

You might be interested in finding out what information was gleaned from some of the early returns. The results so far indicate that the monthly and bimonthly formats are just about tied in popularity. Many of you feel that an expanded bimonthly format would be preferable to the current monthly.

Just about everyone seemed comfortable with the writing style. In addition, few people seem to be having difficulty understanding the material presented. **COLORCUE** received a generally good overall rating, with most people feeling that they were getting their money's worth from their subscription.

Answers to the Content section were most revealing. Almost everyone has been reading the entire newsletter from cover to cover. The sections that were marked "Needs Expansion" showed an overwhelming need to enhance the Advanced Applications section. Also high on your priority list for expansion was Software Explained, User Software Files, New Products, and Keeping It Simple. The section read most frequently was New Products. In response, we will be adding to these sections in the near future.

Many of you requested articles on assembly, or machine language. There were also a great many requests for articles on graphics applications. We will also try to honor these requests in the near future. We would be delighted to put your name into print if you would like to whet the seemingly insatiable appetites of your fellow users by submitting a couple of articles on these topics. Remember the deal, a free subscription or two Sof-Disks for any articles we publish.

A special "thank you" goes to all the budding young publishers out there, who had cost-saving suggestions on **COLORCUE's** production. Many of your ideas were excellent and we will be implementing some of them ASAP. Thanks again for your comments, keep those cards and letters coming. =

Compucolor has made a significant investment in software. In order to protect that investment, we are offering a \$1,000 reward to anyone providing sufficient evidence leading to the conviction of a copyright violator. This extends to all our software including ROMS and PROMS.

COPYRIGHT
PROTECTION

We intend to vigorously prosecute any offender to the limit of the law. =

user group hotline

Many user groups have sprung up during Compucolor's first year. We are currently compiling a list of all Compucolor user groups for publication in a future issue of COLORCUE. If you are a member of either an area or professionally-oriented user group, please help us make our listing complete by supplying us with:

COMPUCOLOR
COMPILING
A LIST OF
USER GROUPS

1. The name of your group
2. The name of the person to get in touch with for information ,
3. The contact's address
4. The contact's telephone number
5. Membership fee (if any)
6. Special benefits
7. Name of any publication or newsletter

As further incentive, send us information about your club and we will extend your subscription to COLORCUE one month. Please mail it to our editorial office, 100 Northcreek, Suite 250, 3715 Northside Parkway, N.W., Atlanta, Georgia 30327, or call us directly at (404) 261-3003. Thanks. =

EDUCATION USER
GROUP FORMING

Many CCII users working in the field of education are interested in forming an education users group. We will be happy to organize this group and help in whatever way we can by supplying you with the names of other users in your field and coordinating an information exchange and an education software bank.

If you would like to join the Education Users Group, please contact us at our editorial office and include your name, address, phone number, and the level of educational applications you are interested in pursuing (that is, primary, secondary, or college/university level).

As soon as the group is formed, we will put you in touch 5

with other CCII users in your field and we can make an effort to address your particular needs. =

product showcase

FORMAT PROGRAM NOW AVAILABLE

And what a clamor there was for this one! **Effective immediately**, the format program will be available for \$24.95 retail and can be purchased directly from your computer store. This Sof-Disk allows you to format other brands of blank mini-disks so that they can be used on your Compucolor II. Of course, for those of you who prefer its convenience, we will continue to offer our Formatted Twin Pak for \$9.95. =

ADD-ON DISK DRIVES \$395

Thinking about adding on a second disk drive to your Compucolor II? Add on now with Compucolor's special one-time offer on separate disk drive units and save \$100! As of November 1979, Compucolor IIs will use disk drives with 4-phase stepper motors instead of the 3-phase drives now in use.

Why the switch? It's simple -- disk drives with 3-phase stepper motors are no longer available from our supplier, Siemens. Therefore, Compucolor is trying to deplete its inventory and is offering the add-on 3-phase drives at \$395, \$100 off the retail price. 4-phase drives aren't compatible with systems currently using the 3-phase drives. Once these add-on disk drives are sold out, you won't be able to add a 4-phase external drive to your existing unit without major modification. Since the supply is limited, please contact your computer store today. =

COMPUSTAND II

The CompuStand II was designed by Non-Pareil Industries specifically to accomodate your Compucolor II. It is available through your computer store or by contacting Non-Pareil Industries directly. See enclosed ad for further details. =

YOU'VE GOT IT SOFT WITH COMPUCOLOR II

We've been turning out Sof-disks left and right, so we'd like to take this opportunity to introduce you to all of the new Compucolor Sof-Disks. If you don't have all of the Sof-Disks listed here, you're really missing out!

GAMES SHARKS

1. SHARKS - Your midnight swim turns into a nightmare when you spot a shark's fin cutting through the waves. Frantically you swim for your life, but your splashing attracts even more sharks. The longer you evade the sharks in this interactive game the higher you score. There is no winning; just see how long you can survive.

2. TOWERS - Restacking the tower seems simple enough, but try it. It's a real challenge. Or watch Compucolor II play and "learn from a master".
3. KALAH - Planning ahead is what this ancient Indian game is all about. Originally played with stones and pits dug into the ground, now you can play without getting your fingernails dirty! Play with a friend or match wits with the Compucolor II.
4. MILL - A game of strategy for two players. If your motives are too obvious, you'll wind up losing. Outwit and capture your opponent by following one simple rule: play sneaky!

AIR RAID

1. AIR RAID - This is no drill, you've got radar confirmation: enemy bombers carrying nuclear weapons are approaching with fighter escorts. Man the anti-aircraft gun--your country is depending on you to bring them down.
2. RACE - Drive as fast as you can, but don't smash into the walls! Up to four players can compete or race against the clock.
3. QUINTOMINOES - Fitting the pieces of this puzzle is hard enough when you are playing by yourself, but when you've got an opponent to play against, good luck.
4. ROVER ROBOT - Will Rover find a path to safety? He can provide limited information about the dangers that lie ahead, but it's up to you to decide his path--and fate!

STAR TRADER

1. STAR TRADER - Learn the principles of stellar economics in this intra-galactic buying and selling game.
2. COLOR HUNT - Muster all your logic to deduce the color code generated by the COMPCOLOR II. The computer analyzes all your guesses and summarizes the results.
3. DECISION-MAKER - Enter information about the decision to be made, and the factors involved, and this program will make the choice for you.
4. PERSONAL CALENDAR - Schedule your events a week, month, or year at a time. This system lets you keep up with your appointments and helps you remember important dates and commitments.
5. CONCENTRATION - A game for two players derived from the popular television game show.

SWARMS

Here's a detailed description of this exciting Sof-Disk.
(Don't worry, there aren't any "bugs" in the program!)

1. SWARMS - Your assignment is to rid the land of killer bees with the arsenal provided for you by the Compucolor II.
2. HUMAN REACTION TIME - Test your ability for high speed instant recall.
3. REVERSE THE NUMBER - Put your logic to the test with this number sequence game. You'll have to be able to visualize

- all possible combinations as you put the digits into their proper order.
- 4. ROULETTE - Just like Las Vegas! Bet on even, odd, red, columns, or pick your own lucky number. The Compucolor II will spin the wheel and record your winnings.
- 5. CAPTURE THE ALIEN - Try to isolate the invader without coming too close. Actual contact could be deadly!

CUBIC TIC-TAC-TOE

- 1. CUBIC TIC-TAC-TOE - A three dimensional version of the familiar game. You can select any of five levels of difficulty.
- 2. GREED - Combine skill, strategy and luck to beat the Compucolor with rolls of the dice.
- 3. GALAXY - A fantastic real time high speed spacewar simulation. Shoot down the enemy ships with your three phasor ports.
- 4. SPACE LANDER - Land your spaceship on the space platform.

SOUNDWARE

This includes both software and hardware necessary to create sounds on the Compucolor II. It doesn't talk, but it allows you to make music and interesting sounds on your Compucolor. Some of these sounds can be heard on the demonstration disk. It is programmable, so that songs with a range of two or three octaves can be written and enjoyed to the delight of the musically inclined. SOUNDWARE is the Registered Trademark of CAP Electronics. =

EQUITY

GENERAL FINANCE AND BUSINESS

If your business owns or is purchasing equipment, this program could be a real money-saver. The disk contains two complex programs; Depreciation and Capitalized Costs.

- 1. DEPRECIATION - Depreciate your equipment by any one of five popular methods: 1) straight line, 2) double-declining balance, 3) constant percentage, 4) sum of the digits, and 5) sink-fund method.
- 2. CAPITALIZED COST - This program will figure out the true cost of each asset. It will calculate the capitalized cost of periodic changes of up to three assets simultaneously to determine the best option. In addition, the COMPUCOLOR II will quickly solve for any variable in the capitalization equation. =

SYSTEM SOFTWARE BASIC EDITING

- 1. FRIENDLY EDITOR (FRED16) (FRED32) - A sophisticated editor for BASIC programs. Available features include the

- ability to edit any line, move existing lines, delete a range of lines, and to search for the occurrence of any string, variable, or command within a program.
- 2. RENUMBER (RENUM) - Renumerates BASIC programs. An entire program or any section of a program can be renumbered. You determine starting line numbers and increments.
 - 3. MERGE (MERGE) - This program will allow you to merge two separate BASIC programs and combine them into one.
 - 4. COMPACT (COMPAC) - Allows you to conserve memory by deleting unnecessary spaces from your BASIC program.
 - 5. REMPAC - A space saving program that deletes remarks and unnecessary spaces from your file while maintaining proper spacing.
 - 6. BASIC SOURCE - Converts a BASIC file to a SOURCE file to facilitate conversions.

MONITOR

The MONITOR is used to display and alter the memory contents of the COMPUCOLOR II. Memory can be displayed in hex or ASCII. Memory can be moved, filled with a constant, or substituted with new values. A call can be made to an address with breakpoints and a register dump. Source code is included so that you can assemble it to the location you need.

SCREEN EDITOR

The Compucolor II Screen Editor is a powerful text editor designed for editing and creating source files. Since the contents of a file are displayed on the screen, editing is easy.

The Screen Editor requires 16K minimum memory and the 117 key keyboard (part number #101000). This allows the use of 31 single key commands such as TOP OF PAGE, END OF PAGE, SEARCH (both forward and reverse), READ, WRITE, DELETE CHARACTER, and DELETE LINE. In addition, a file can be cycled, which saves the file currently in the buffer and allows you to continue editing by rewinding the file. Eight cursor commands allow easy editing with a four color intelligent cursor.

MACHINE LANGUAGE DEBUG PACKAGE

The Compucolor MLDP is designed to facilitate the coding and debugging of machine language programs. It contains commands to set breakpoints (up to eight at one time), manipulate machine registers, obtain a hex dump of memory, alter memory to a numeric or character value, disassemble memory to mnemonics, enter mnemonics which are immediately assembled and stored in memory, move a memory range, fill a memory range with a constant, execute a machine language program, true interpretation of a program, and single step a program. MDLP is an extremely versatile tool whereby execution of a program can be halted at any point, and the states of the registers and memory noted and/or altered. Breakpoints can even be set in ROM. Included in all commands that accept

numeric parameters is the ability to calculate the value of any expression involving constants, registers, or memory locations and algebraic numeric, logical, and comparative functions.

ASSEMBLER

Converts source programs created on the Compucolor II Text Editor into 8080 object code, and checks for syntactical errors. The source and object program sizes are limited only by the available disk space and not by available memory.

TEXT EDITOR

The Text Editor is a RAM program designed to facilitate the generation and correction of source programs and other text files. File sizes are limited only by the disk space available and not by the buffer size.

PERSONAL DATA BASE

Complex programs like PDB used to be available only for large computers, but now it's here for your Compucolor II. With it, you can create your own data base management system. Create, save, and easily access a mailing list, insurance inventory, and so on. You can also selectively search data. For example, you can retrieve a list of all customers who live in Georgia and have made a purchase in the past six months. Easy to use, it comes with a detailed manual. =

ENGINEERING STATISTICS I

1. FILES - a file manager program that generates, maintains, and displays files for use with other programs.
2. REGRES - This program performs a linear, logarithmic, exponential, or reciprocal regression analysis with confidence limits and a graph.
3. PLOT - Plots one to three graphs on a rectangular coordinate system from data in a disk file or from given equations.
4. STAT - Computes and displays several measures of central tendency and other quantiles, dispersions, skew, kurtosis, and moment about the mean from grouped or ungrouped data.
5. GRAPH - This program displays histograms and/or polygonal graphs for grouped or ungrouped data.

STATISTICS II - REGRESSION

1. FILES - A file manager program that generates, maintains, and displays files for use with other programs.

2. MLTREG - Performs multiple linear regression on up to six variables (including independent variable) with or without transforms.
3. POLREG - This program performs polynomial regression using a polynomial of degree up to five.
4. DISREG - Fits binomial, norm, or Poisson distributions to input data. A chi-square test for goodness of fit may then be performed.
5. VARINZ - This program uses data from a set of samples of varying sizes to compute statistics for each sample, to analyze variance between samples and to provide estimates of the evaluation mean.

STATISTICS III - TIME SERIES

1. FILES - A file manager program that generates, maintains, and displays files for use with other programs.
2. TIMSER - Performs trend regression, deseasonalization, or other cyclic adjustments and smoothing of a time series.
3. INDEX - Computes eight types of index numbers for several sets of data. Any of the data sets may be used as data for the base period, and period may be individually compared to the base period.
4. CMPTIM - Computes variation within or between pairs of time series for a set of time series input.
5. RANK - This program performs a rank analysis on pairs of data series using the Mann-Whitney test and also computes rank correlation.

There's even more to come. We'll announce new Sof-Disks in future issues of COLORCUE. Check with your local Compucolor dealer for all the latest in software.

By the way, Sof-Disks make great Christmas presents. You may want to circle the Sof-Disks you want and leave it in some conspicuous place. An elf we know suggested circling the entire price list, but we think that's going too far. After all, why would you want two Samplers? =

the drawing board

Your Compucolor II can teach you BASIC programming language in no time with the new BASIC Tutorial Sof-Disks! For beginning programmers, the series starts off with the basics -- teaching the use of line numbers and simple statements, and continues with more advanced concepts such as plotting, and subroutines used in writing programs.

NEW SOF-DISK
SERIES TEACHES
BASIC

BASIC Tutorial I consists of ten lessons on two Sof-Disks. These lessons not only illustrate BASIC language concepts but specifically how these concepts are used in the CCII including how to plot points and lines, how to use the 64 color

combinations, ASCII characters in two sizes, blinking characters, special characters, the blind cursor mode, and how to create artwork and logos.

Here's the MENU for BASIC Tutorial 1:

- | | |
|--------------|---|
| Lesson 1 -- | Demo of BASIC Capabilities |
| Lesson 2 -- | Introduction and Escape Sequences |
| Lesson 3 -- | Fundamentals and Simple Programming |
| Lesson 4 -- | More Statements, Features, and Programming |
| Lesson 5 -- | Loops, Subroutines, Branching and Functions |
| Lesson 6 -- | Graphics |
| Lesson 7 -- | User Functions, Arrays, and Disk Features |
| Lesson 8 -- | The File Control System |
| Lesson 9 -- | Random Files |
| Lesson 10 -- | Programming in the BASIC Demo |

During each lesson, you will be introduced to a technique and then given a chance to try what you have just learned. When you've finished programming, you merely touch the AUTO key to continue with the lesson. If you want to go on to another lesson, just type "MENU" before hitting the return key.

Throughout the series, we've used color to make key concepts easier to remember. Green is used in the text of the tutorial. White is used for important information or concepts. Yellow identifies a programming phrase, keyboard key or program listing. Red is used to show the results of a program used as an example. Cyan defines what a key or statement means or does, and blue is used for emphasis.

If anyone in your household would like to learn programming the logical (and colorful) way -- by using the Compucolor II -- get them the BASIC Tutorial Sof-Disk Series. BASIC Tutorial I, a two Sof-Disk album, sells for only \$24.95. Look for it at your dealer today! =

keeping it simple

RANDOM FILES 2:

THE PERSONAL DATA BASE AND THE SELECTIVE HOLD FILE

Let's discuss a random file program that works with the Personal Data Base. By way of introduction, the Personal Data Base is a versatile system which allows you to create a personal master file capable of holding a wide variety of specific information. With the PDB, you can add, update, and delete any data base record. You can print records in alphabetical order and otherwise format the output in various ways. In addition, you can search records, create new files by using selection criteria, and index a random file created by another program. The Personal Data Base runs in 16K however, long records may require additional memory. The retail price of the Personal Data Base is \$39.95.

Hold File". This is simply a file with one number per record. Each number represents the record number of a random file record meeting specific selection criteria. By using the data base manager and the Selective Hold File, you can enter, edit, search, print, and so on, and still access specific data in other BASIC programs. Creating a Selective Hold File is one of the three options available through the Format file of the Personal Data Base. Detailed information on how to create the Selective Hold File is located on pages 24-26 in your Personal Data Base documentation.

Suppose we are looking at several new car models and wanted to compare statistics? We can create a Selective Hold File containing all the various car buying information that we need and then, by writing a simple program, compare that information, project the "true cost" of ownership and make a buying decision based on precise figures rather than on a "gut" judgement.

What do we need? For example, we can have our program compare the base price, the cost of options, the current interest rate (**this** is a variable!!), and the amount of mileage we estimate that we will be putting on the car. We can also have a factor that will raise or lower the resale value based on the car's mileage compared to the average car's mileage. And how about making the cost of gas a variable which can change at a given rate? Some "economy" cars seem to be good investments only if you predict the cost of gas increasing by X amount. The Personal Data Base provides much of the bookkeeping code needed for these applications and lets you spend your time writing programs which compare the selected data.

Let's make up a sample data base with car buying information for any number of car models in these fields:

MAKE	A8
PRICE	N
MILEAGE	N
MAINTENANCE	N
EVALUATION	N

The following sample program will take the Selective Hold File that we have just set up and turn the fields into variables.

```
100 FILE "R",1,"CARS",1:REM RANDOM FILE OF CARS
200 FILE "R",2,"GOOD.HLD",100:REM SELECTIVE HOLD FILE
350 CLEAR 100:
500 GET 2;RC:REM GET RECORD NUMBER FROM HLD FILE WITH
    AUTO INCREMENT
550 IF RC=0 THEN END:REM ZERO MARKS END OF FILE
600 REM NOW GET THE RECORD FROM THE RND FILE
700 GET 1,RC;A$MD$[8],SP,MC,MR,D9,D8,D7,EV$[32]
```

```

800 REM EACH VARIABLE IN EXACT SIZE AND ORDER AS THE
     DDL FILE
900 REM NOW DO ANY PROCESSING YOU WISH
1000 GOTO 500:REM GET NEXT RECORD AND DO IT ALL AGAIN

```

Now you may calculate monthly payments, add cost of gas, and depreciation and compare the **true** cost of ownership for various cars. Here's a short program which compares three variables: price, average mileage, and estimated maintenance.

```

100 REM AN OVERALL RATING OF CARS
105 CLEAR 100
110 FILE "R",1,"CARS",1:REM RANDOM FILE FOR CARS
120 FILE "R",2,"GOOD.HLD",100:REM SELECTIVE HOLD FILE
130 FILE "A",2,CR,NR,RS,BF:REM GET FILE SPECIFICATIONS
140 DIM MA$(NR),SP(NR,4),X(NR,2):REM ARRAYS FOR CARS
160 GET 2;RC:REM GET RECORD NUMBER OF "CARS" FILE
170 IF RC= 0THEN 200:REM END OF SEQUENTIAL ACCESS
175 A= A+ 1
180 GET 1,RC;MA$(A) [8],SP(A,1),SP(A,2),SP(A,3):REM GET
     INFORMATION
190 GOTO 160
200 NR= A:REM SET COUNTER TO NUMBER OF CARS
212 PLOT 12:INPUT "NUMBER YEARS YOU WILL OWN THE CAR: ";NY
214 INPUT "NUMBER MILE PER YEAR YOU WILL DRIVE: ";MY
216 INPUT "CURRENT GAS PRICES: ";GP
220 FOR X= 1TO NR
230 XX= (NY* MY)/ SP(X,2):XX= XX* GP:REM COMPUTE GAS USED
240 XX= XX+ SP(X,1):REM ADD TO BASIC PRICE
250 X(X,2)= SP(X,3)* NY+ XX:REM NOW ADD MANTAINENCE
260 X(X,1)= X:REM SET X(X,1) EQUAL TO CAR
270 NEXT X
310 FOR Y= 1TO NR:FOR X= 1TO NR
320 IF X(X,2)> X(X- 1,2)THEN 350:REM X(X,2) IS GREATER
330 X1= X(X,2):X(X,2)= X(X- 1,2):X(X- 1,2)= X1:REM NOT
     GREATER, SO SWITCH VALUES
340 X1= X(X,1):X(X,1)= X(X- 1,1):X(X- 1,1)= X1:REM SWITCH
     CAR NUMBER
350 NEXT X,Y:PRINT
355 PLOT 12:PRINT , "CAR" , , "PRICE" , , "SCALE OF 1 TO 10":PRINT
360 FOR X= 1TO NR:PRINT ,MA$(X(X,1));TAB( 32);X(X,2);
     TAB( 48);:REM PRINT CAR, EVALUATION
370 SP(X,4)= 10* (X(1,2)/ X(X,2)):PRINT SP(X,4):NEXT :REM
     ADD PERCENTAGE TO TOTAL
390 FILE "C",1,2 =

```

advanced applications

own. Future topics will include:

- 1) System routines, their addresses and their functions,
- 2) Utility routines for frequently used functions,
- 3) Special purpose routines for functions such as partial screen scrolling, and so on,
- 4) The addresses for variables and routines for both V6.78 & V8.79 software.

Before beginning, here are some suggestions for reading material on assembly language that might be helpful. If you have any other suggestions, please send us the title of the book or article, where and when it was published, the name of the publisher and the copyright date. If it is a short article, you might even send us a copy. We will publish a bibliography at the end of the series.

These suggestions for reference manuals are available from the Intel Technical Library.

1)	8080/8085 Assembly Language Programming Manual (98-301)	\$ 10.00
2)	MCS-80 User's Manual (98-153)	\$ 7.50
3)	8080/8085 Reference Card (98-438)	N/C

An order form for requesting these manuals from Intel is provided at the end of this article. Please do not send your order to Compucolor, we will have to return it. Order these materials direct from the publisher by sending your check or money order to:

Intel Corporation
Literature Department
3065 Bowers Avenue
Santa Clara, California 95051
(408) 987-6475

Prices are subject to change, so if you have any questions or need more information, call them at the number listed above.

Two of the most useful routines provided in the system software are 'LO' and 'OSTR'. We recommend that you retain the names of the routines as given in the original software. The two routines mentioned are routines that enable you to output a byte (LO) or to output a string (OSTR) to the screen.

'LO' is a routine for output of a single character to the screen. The ASCII representation of the character is placed in the A register when the 'LO' is called. Here's an example:

```
MVI A,'Z'      ; PLACE Z IN REGISTER A
CALL LO        ; OUTPUT TO SCREEN
```

Another example would be:

```
MVI A,13       ; PLACE ASCII 'CARRIAGE RETURN'
                IN A
```

```
CALL LO  
MVI A,10 ; PLACE ASCII 'LINEFEED' IN A  
CALL LO
```

The ASCII values can be found in your Compucolor **Programming Manual**, Appendix E. A character or characters enclosed with single quotes means to take the ASCII values of the character(s) within the quotes.

'OSTR' is similar to 'LO' except that more than one character can be specified for output. The address of the first byte of the string is placed in register pair 'HL' and then 'OSTR' is called. The string must end with the byte value of 239. Also supported are repeat loops of the form "...,237,N,D1,D2,D3,...,DM,238,...." where 'N' is the number of times the string 'D1,D2,D3,...,DM' is to be repeated. The following examples should clarify the function of 'OSTR'.

```
MESSAG: DB 'THIS IS A TEST',13,10,239  
  
LXI H,MESSAG ; GET ADDRESS OF 'MESSAG' IN HL  
CALL OSTR
```

The output is the string 'THIS IS A TEST' followed by a carriage return and a linefeed. 'MESSAG' should be placed so that it will not be interpreted as instructions. An example of repeated strings is:

```
MESSAG: DB 'REPEAT TEST',237,5,' 1234567',238,  
        ' END OF'  
        DB ' TEST',13,10,239  
  
LXI H,MESSAG ; GET ADDRESS OF 'MESSAG' IN HL  
CALL OSTR
```

The output would be:

```
REPEAT TEST 1234567 1234567 1234567 1234567 1234567  
END OF TEST
```

This is followed by a carriage return and a linefeed.

The locations of these routines (the address to be called) are:

16	LO	EQU	3392H	; FOR V6.78 SOFTWARE
	or			
	LO	EQU	17C8H	; FOR V8.79 SOFTWARE
	OSTR	EQU	33F4H	; FOR V6.78 SOFTWARE
	or			
	OSTR	EQU	182AH	; FOR V8.79 SOFTWARE

'EQU' allows you to refer to the address of the routine by the name of the routine rather than by its absolute address. This usually makes the code more readable. The 'H' following the 4-digit address means that the number is represented in its hexadecimal notation (base 16). If a hexadecimal address begins with a letter, such as 'A120H', it should be preceded by a zero (0A120H).

'LO' and 'OSTR' can be used for plotting functions such as line drawing, changing colors, erasing the screen and positioning the cursor. The values are the same as those listed in your **Programming Manual**, Appendix C.

In the next issue, a 'character input' routine will be discussed along with more routine addresses and more references for your library. Please send us any of your ideas or suggestions that might make this series more beneficial. =

input

INPUT is a forum for information exchange between Compucolor users. Compucolor assumes no responsibility for the accuracy of this information or for any complications which might result.

From Ed Redfield, 1852 Walker Avenue, Winter Park, Florida 32789:

While working with the checkbook program contained on the Math Tutor diskette, I found that in order to get a year end listing by category (option 6, I believe), I had to either memorize the 14 categories for checks and 4 for deposits, or write them down. With the addition of the following 6 program lines, the program will list the desired listings prior to the program asking for a selection category:

```
900 REM
1145 IF SB=6 THEN RETURN
1900 REM
2055 IF SB=6 THEN RETURN
6002 IF T$="C" THEN GOSUB 900
6003 IF T$="D" THEN GOSUB 1900
```

Other Colorcue subscribers may be interested in adding these lines to their Checkbook program for the added convenience it provides.

Please enclose my address with this, as I would be interested in hearing from other Compucolor II users. =

Mr. and Mrs. Kelly Gomas in Tucson, Arizona have sent us a program to calculate time between two dates:

```

6210      Rem Inputs    J1
                J2
                Output   LT
6220      G1$=STR$(J1):G2$=STR$(J2)
6225      Y1$=LEFT$(G1$,3):Y2$=LEFT$(G2$,3)
6230      D1$=RIGHT$(G1$,3):D2$=RIGHT$(G2$,3)
6235      D1=VAL(D1$):D2=VAL(D2$)
6240      Y1=VAL(Y1$):Y2=VAL(Y2$)
6245      IF Y1=Y2 THEN LT=D2-D1:RETURN
6250      TD=365
6255      IF INT(Y1/4)=Y1/4 THEN TD=366
6260      TD=TD-D1
6265      IF Y1+1=Y2 THEN LT=TD+D2:RETURN
6270      FOR R2=Y1+1 TO Y2-1
6275      IF INT(R2/4)=R2/4 THEN TD=TD+366:GOTO 6285
6280      TD=TD+365
6285      NEXT R2:LT=TD+D2:RETURN

6600      REM CONVERT JULIAN DATE TO GREGORIAN
6610      RESTORE 7060
6615      IF JD=0 THEN DA$=" " :RETURN
6620      YR=INT(JD/1000):DY=JD-(YR*1000)
6630      FOR I=1 TO 12:READ MO$(I),ND(I)
6640      IF I=2 THEN ND(I)=28:IF INT(YR/4)=YR/4 THEN ND(I)=29
6650      IF SGN(DY-ND(I)) < 1 THEN GOTO 6680
6660      DY=DY-ND(I)
6670      NEXT I:PRINT "ERROR":RETURN
6680      REM
6685      DA$=STR$(I*10000+(DY*100)+YR)
6690      IF VAL(DA$)<100000 THEN DA$="0"+RIGHT$(DA$,5)
6695      IF LEN(DA$)> 6 THEN DA$=RIGHT$(DA$,6)
6699      RETURN
                :
7000      REM CONVERT GREGORIAN DATE TO JULIAN DATE
7005      RESTORE 7060
7010      JD=(VAL(RIGHT$(DA$,2))*1000)+(VAL(MID$(DA$,3,2)))
7030      FOR I=1 TO VAL(LEFT$(DA$,2))
7035      READ MO$(I),ND(I)
7040      IF I=2 THEN ND(2)=28:
7045      IF INT(VAL(RIGHT$(DA$,2))/4)=VAL(RIGHT$(DA$,2))/2 THEN ND(2)= 29
7045      IF I<VAL(LEFT$(DA$,2)) THEN JD=JD+ND(I)
7050      NEXT I
7058      RETURN

7060      DATA JAN,31,FEB,0,MAR,31,APR,30,MAY,31,JUN,30,
                JUL,31,AUG,31,SEPT,30,OCT,31,NOV,30,DEC,31

```

And here's a routine that will return you to an adjusted fixed point in your program:

```

50      REM ROUTINE TO RETURN ADJUSTED FIXED POINT
100     INPUT "AMOUNT";AM
101     S=SGN(AM)
102     AM=ABS(AM)
18      105    CX=AM-INT(AM)

```

```
106    AM=INT(AM)
107    AM$=RIGHT$(STR$(AM),LEN(STR$(AM))-1)
108    IF CX=0 THEN GOTO 520
110    CX=CX+.001
500    CX$=MID$(STR$(CX),2,3)
510    AM$=AM$+CX$
515    GOTO 525
520    AM$=AM$+".00"
525    IF S=-1 THEN AM$="-"+AM$
530    PRINT AM$ or AM$=" "+AM$ for at least 8 sig chars
540    GOTO 100 =
```

Here's an excerpt from a letter by Bill Shanks of Vicksburg, Miss.:

Following is a variation of Sampler which I devised and sent to our six year old Compucolor II user in Arkansas to show off to her friends! We use it to demonstrate the beauty of our CCII to impress our friends:

Put the Sampler disk in the CCII
Type in LOAD "DEMO"
When it returns READY, type in:
 11084 GOTO 240
Then Return
Then type in:
 RUN 240
Then Return.

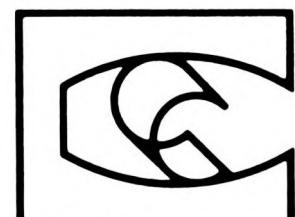
This gives a continuously running color display that is really beautiful!

There is another color display I enjoy watching and showing, too. It is in the **Programming Manual** on page 69. There may be an error in step 80 which I think should read: 80 PLOT 32,26:REM ...etc. The interesting thing about this program is that the random display will move while running when you operate the cursor controls. You could also make it longer by increasing the 1000 in step 60. It could also be made to cycle indefinitely by a GOTO maybe before 110 or instead of END in 120. =

attn/break

In the article on Arrays in the last issue, we inadvertently used the same line number on two different lines of the program example. Specifically, on page 7, the dimension statement should be changed from line 110 to line 90. This will avoid eliminating line 110 of the program.

And, in our article on Random Files, check the fourth paragraph on page 10. The last sentence should read "In our example, if we used a blocking factor of 1," (NOT 8) "each 128 byte page would contain only 32 bytes -- 96 bytes would be wasted." =



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